DOCUMENT RESUME

ED 182 658 CG 014 160

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TITLE The Effects of Belief Change on Prior and Consequent Beliefs.
PUB DATE Sep 79
NOTE 32p.; Paper presented at the Annual Convention of the American Psychological Association (87th, New York, NY, September 1-5, 1979)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Adults; *Beliefs; *Goodness of Fit; Models; *Predictor Variables; *Probability; Research Methodology; *Research Problems; Research Projects
IDENTIFIERS *Attitude Change; *Wyer Subjective Probability Model

ABSTRACT

The effect of certain methodological changes on the fit of the Wyer subjective probability model and the effect of belief change on cognitive structure were investigated. Using syllogistically-related proposition sets of the form "A," "If A then B," "If not A then B," "B," it was found that certain methodological improvements could increase the fit of the model above that obtained in previous research. Given a change in the subjective probability of "A," results indicated that the Wyer probability model predicted the observed change with reasonable accuracy. Changes in "A" beliefs tended to produce changes in related "B" beliefs but not in the conditional probabilities. In the case of a change in a "B" belief, however, there was no evidence of a corresponding change in the related "A" belief. (Author)

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ED182658

THE EFFECTS OF BELIEF CHANGE ON "PRIOR" AND "CONSEQUENT" BELIEFS

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Paper presented at the 87th Annual Convention of the American Psychological Association, New York City, September, 1979. For reprints, see Footnote 1.

CG 014160

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Abstract

Using the Wyer subjective probability model, the present study investigated the effect of certain methodological changes on the fit of the model, and the effect of belief change on cognitive structure. Using syllogistically related proposition sets of the form "A," "If A then B," "If not A then B," "B," it was found that certain methodological improvements could increase the fit of the model above that obtained in previous research. Given a change in the subjective probability of A, it was found that (1) the Wyer probability model predicted the observed amount of change with reasonable accuracy; (2) that changes in "A" beliefs tended to produce changes in related "B" beliefs and not in the conditional probabilities. In the case of a change in a "B" belief, however, there was no evidence for a corresponding change in the related "A" belief. No clear explanation of this effect presented itself.

Continuing a research tradition begun by McGuire (1960a, b, c), Wyer and his colleagues have been investigating the utility of subjective probability models of cognitive structure. This approach measures beliefs as subjective probabilities (cf. Fishbein & Ajzen, 1975) and then postulates that subjective probabilities are structured in accord with the laws of probability theory. One subjective probability model which has received support is that proposed by Wyer and Goldberg (1970). Consider the following propositions:

> A: There will soon be a substantial increase in the number of police officers in St. Louis.
>
> B/A: Suppose that there will soon be a substantial increase in the number of police officers in St. Louis. All things considered, how likely is it that the crime rate in St. Louis will decrease in the near future?
>
> B/A': Suppose that there will <u>not</u> soon be a substantial increase in the number of police officers in St. Louis. All things considered, how likely is it that the crime rate in St. Louis will decrease in the near future?
>
> B: The crime rate in St. Louis will decrease in the near future.

Wyer and Goldberg (1970) presented an equation which represents the interrelationships among these beliefs:

$$Pb = PaPb/a + (1 - Pa)Pb/a' \qquad [1]$$

where Pa, Pb, Pb/a and Pb/a' are the subjective probability ratings of statements of the form shown above. The "B/A" and "B/A'" statements are referred to as positive and negative "conditionals"; they measure the probability that "B" is true on

the condition that A is or is not true. Wyer has observed some support for this model both in correlational (Wyer, 1970, 1972, 1973b) and functional measurement (Wyer, 1975b) paradigms. The utility of the model has been discussed by Wyer and Goldberg (1970) and the approach has also been extended to the prediction of behavior by Jaccard (Jaccard and King, 1977; Jaccard, Knox, & Brinberg, 1979).. However, a number of important theoretical and methodological issues in the context of this research have not been investigated. The purpose of the present investigation was to consider some of these unresolved issues in the context of describing the relationships between beliefs and the general analysis of belief change.

Fit of the Model and the Measurement of Conditional Probabilities

Data regarding the goodness-of-fit of Wyer's model have been mixed. At the group level, mean predicted and obtained Pb scores have been in strong agreement. Analysed across syllogisms, these measures regularly yield correlations between predicted and obtained scores above .90. On the individual level, however, goodness of fit has not been as good (Wyer, 1970, 1976; Wyer & Goldberg, 1970).

One factor which may contribute to this is Wyer's operationalization of conditional probabilities in his research. Tests of Wyer's model have assessed conditional probabilities of the form "if A, then B" (Pb/A) and "if not A, then B" (Pb/a'). For example, a respondent might be asked to rate the probability of the truth of a statement of the form "If drug companies

charge excessive prices for the pills they produce, then the size of their profits should be regulated by the government." According to probability theory, if Pa and Pb are independent, then Pb/a = Pb. Taking an extreme case, if B refers to the statement "Ted Kennedy is a liberal" and A refers to the statement "Bob likes psychology," then the rating of Pb/a (if Bob likes psychology, then Ted Kennedy is a liberal) should equal Pb. It may be however, that respondents are not interpreting the nature of the conditional probability correctly when it is given in the if-then format. Respondents could conceivably be interpreting the conditional B given A in terms of A's causal implications for B. If this were the case, the example given above would most likely be assigned a subjective probability near zero (i. e., the likelihood that if Bob likes psychology then, because of that, Ted Kennedy is a liberal would be zero).

Such a misinterpretation would render previous tests of Wyer's model ambiguous. When beliefs A and B are perceived as dependent, the model should provide a relatively good fit. When beliefs A and B are independent, however, the model would not fit as well. One purpose of the present investigation was to examine the possibility of this methodological problem in previous applications of subjective probability models with regard to goodness of fit. It should be noted that this issue poses a potential problem not only for Wyer's research, but other research that has used subjective probability models employing conditional probabilities.

Ramifications of Belief Change.

Another purpose of the present study was to investigate the extension of equation [1] from a description of the static state of cognitive structure to the dynamic case of describing the ramifications of belief change. The change equation corresponding to equation [1] is

$$\Delta Pb = \Delta [PaPb/a + (1 - Pa)Pb/a'] \qquad [2]$$

where ΔPb is the observed change in the subjective probability of a "B" statement, and the right hand side of the equation denotes the change in Pb predicted on the basis of equation [1]. A change in Pa through, for example, the administration of a persuasive message, would automatically produce changes in the right-hand side of equation [1]. The question is, happens psychologically? Is "cognitive balance" restored, and if so, how?

Five studies in the Wyer tradition have addressed themselves to the accuracy of equation [2] in predicting the logical repercussions of such a change. Wyer and Goldberg (1970), in two studies, found rather disappointing support for the applicability of the change equation. Only one of the two correlations between predicted and observed ΔPb values which they obtained was significant. That same year, Wyer (1970) reported another study which also examined equation [2]. No correlations were reported, but the differences between mean predicted and observed ΔPb values were significant in an analysis of variance.

Wyer (1972) reported a study which examined the extent to which equation [2] could be used to describe social evaluation processes. Respondents were first asked to rate how probable it was that they possessed a given trait, and the conditional probabilities that (1) another respondent liked them; (2) that they liked the other respondent, and (3) that they were "generally liked", given that they did or did not have that trait. Respondents then received false feedback concerning whether or not the other respondent felt that they had the trait in question. It was found that equation [2] predicted reasonably well for the first two conditions; the correlations between the predicted and observed ΔPb values were consistently greater than or equal to 0.91.

Overall, then, previous studies indicate reasonably good fit of equation [2] in predicting belief change. In light of this evidence, the following hypothesis was offered:

> H1: Given a change in Pa, changes will be observed in the related Pb, Pb/a, or Pb/a' terms, or some combination of them. These changes will occur in such a way as to maintain the balance described in equation [2].

Change Mechanisms

Wyer and his colleagues have not closely examined the precise ramifications of a change in the Pa term on cognitive structure. For example, a change in the Pa term might occur without producing a change in the Pb term, but still not disrupt the balance of equation [2]. This could occur in either of two ways, both of which concern the salience of A with respect to B.

This salience factor reflects the extent to which changes in Pa will produce changes in Pb and is measured as the absolute value of the difference between the conditionals:

$$Sal = | Pb/a - Pb/a' | \qquad [3]$$

When this value is zero (i. e., when the subjective probability of B bears no relation to the subjective probability of A), then a change in Pa will have no effect on Pb. Alternatively, if a change in Pa is accompanied by a "compensatory" change in the salience of A with respect to B, balance might be maintained without a change in Pb. The concentration of Wyer and his colleagues on the gross level of analysis represented by correlating predicted and observed change scores neglects consideration of the mechanisms by which the balance of the model is maintained after the change, whether through changes in Pb or changes in the salience. It was one of the purposes of the present study to make such an examination.

An Extension: The Effect of Changing a Conclusion

Consider the following set of propositions:

C

If C then A

A

If A then B

B

While the research noted above seems to indicate that changes in Pa might produce changes in Pb, an additional issue is the possibility of reversing the direction of this influence;

obtaining a change in Pc by changing Pa, or, to use syllogistic terminology, obtaining a change in the belief in a premise by changing belief in the conclusion. Wyer (1975a) addressed this issue by first having respondents record their subjective probabilities concerning various propositions. Then, in a two-by-two design, respondents were informed that either "most" or "few" other introductory psychology students agreed with A, and that they were required to write an essay either in favor of or arguing against A. He found that these manipulations produced significant changes in in a Pa term, but no significant changes in the corresponding Pb (as diagrammed above). Significant changes in Pc occurred only when other were reported to agree with A; in that case, beliefs changed in accordance with the direction of the essay.

The ambiguity of these results, and the possibility that they were affected by demand characteristics, would seem to indicate that the question of the effects of belief change remains an open issue for psychological research. The extent to which such changes were observed was examined in this study. Specifically,

> H2. Given a proposition set, and a change in the subjective probability of its conclusion, a corresponding change will occur either in the premise, or in the psychological salience of the premise with respect to the conclusion, or both. This change will occur in such a way as to restore the balance of equation [6].

In summary, the present study sought to address (1) the ramifications of certain methodological changes on the accuracy of measuring conditional probabilities; (2) the extent to which

equation [2] is an accurate model of cognitive structure in light of belief change; (3) what mechanisms for the restoration of cognitive balance tend to be evidenced after a belief change; and (4) the extent to which changes in the subjective probabilities of premises affect the subjective probability of the related conclusions, and vice versa.

EXPERIMENT 1

The first experiment addressed the issue of the measurement of conditional probabilities in previous research. A questionnaire consisting of 40 belief statements was administered to two groups of 22 and 18 introductory psychology students who were fulfilling a course requirement regarding experimental participation. These 40 statements reflected 10 syllogistically related proposition sets (4 statements per set, Pa, Pb, Pb/a, and Pb/a'). Each statement was rated on a 21 point likely-unlikely scale ranging from 0 to 100 in units of 5. Respondents were told that the zero point indicated that the statement was not true, or completely unlikely, and that 100 signified that the statement was definitely true or completely likely, and that 50 represented a neutral point; that the statement may or may not be true. (See Donahue, 1979 for a more complete description of these measures and pretests concerning their validity and reliability.)

Seven of the syllogisms consisted of premises and conclusion that the experimenter judged to be dependent to some degree. Three of the syllogisms contained premises and conclusions that were judged to be independent. An example of the former is

Pa: There will be a shortage of eggs next year.

Pb/a: If there is a shortage of eggs next year, the price of eggs will rise sharply next year.

Pb: The price of eggs will rise sharply next year.

An example of the latter is

Pa: The university regulation against smoking was made to safeguard the lives of students.

Pb/a: If the university regulation against smoking was made to safeguard the lives of students, then people over 65 have trouble living on the amount of money given them by Social Security.

Pb: People over 65 have trouble living on the amount of money given them by Social Security.

Group 1 indicated their beliefs in each of the 40 statements (Pa, Pb, Pb/a, and Pb/a', for each of the 10 syllogisms) using the standard format in Wyer's research (i. e., conditionals were measured via the "if-then" format shown above). Group 2 indicated their beliefs in the same 40 statements, but with an alternative wording of the conditionals. An example of the format is the following:

Pb/a: If, in addition to what you already know you found out that the University regulation against smoking was, in fact, made to safeguard the lives of students, then considering this as well as your previous knowledge, how likely would you say it is that people over 65 have trouble living on the amount of money given them by Social Security?

Results

For each respondent, an estimated Pb was computed in accord with equation [2]. Mean predicted and observed Pb scores (N =

10) were correlated .203 and .900 for groups 1 and 2 respectively. The extremely low correlation between the predicted and observed Pb values in Group 1 was entirely due to the three "independent" syllogisms. As expected, the conditional probabilities for these syllogisms were excessively low (about .20). In contrast, when only the seven "dependent" syllogisms were analysed, the correlations between mean predicted and observed Pb values was .932 for Group 1 and .929 for Group 2.

One possible interpretation of these data is the participants responded to nonsense (i. e., the three "independent" syllogisms) with nonsense and the results are therefore artificial. However, analysis of the correlations across individual suggests something more substantial. Considering only the seven "dependent" syllogisms, the average correlation (r to z transform) across individuals was .587 in group 1 and .716 in group 2. It appears that the alternative measurement of the conditional increased the predictability of Wyer's model over and above the effect attributable to the "nonsense" syllogisms. Further, the correlation between predicted and observed Pb values was higher in nine out of the ten syllogisms for Group 2 than for Group 1.

The results of this experiment were replicated using a less verbose phrasing of the conditionals (e. g., Suppose that there will be a shortage of eggs next year. All things considered, how likely is it that the price of eggs will rise sharply next year?) This replication is reported in Donahue (1979). Both

studies suggest that the "if-then" format used to measure conditional probabilities may be inappropriate.

EXPERIMENT 2

The second experiment was designed to test the issues of theoretical interest outlined in the introduction using measurement procedures based on experiment 1.

Method

Subjects

The respondents were 92 introductory psychology students at Purdue University. Participation in the experiment fulfilled an optional course requirement.

Design

Using the notation standardized by Campbell and Stanley (1963), the design and number of respondents in each group are shown in Figure 1. The time between sessions was one week. The "observations" were the completion of the subjective probability questionnaire described below. The "treatments" were the administration of four persuasive messages, which argued that (1) there would be an increase in the number of police officers in St. Louis; (2) there would be a shortage of eggs in the coming year; (3) the gravitational pull of the sun on the moon is greater than that of the earth, and (4) that the population of Mexico would double in the next twenty-five years.

Insert Figure 1 about here

Materials

The questionnaire consisted of 60 belief statements, yielding 15 syllogistically related proposition sets (4 statements per set, Pa, Pb, Pb/a, and Pb/a'). All of the A propositions were randomly ordered and presented first, followed by a different random ordering of the B statements. The positive and negative conditionals were presented next, each with its compliment, in a third random order. Each statement was rated on a 21-point subjective probability scale, ranging from 0 to 100 in units of 5. The respondents were instructed that the zero point indicated that a statement was complete unlikely, or definitely not true, that the rating 100 indicated that a statement was certain, or completely true, and that a rating of 50 was a mid-point; that as far as they were concerned, it was equally likely that the statement was true or untrue. All respondents completed a short practice section to establish anchor-points and reduce warm-up effects in the data. The pretesting of these scales reported by Donahue (1979) indicated satisfactory psychometric characteristics of this format.

The persuasive messages were four paragraphs, each approximately 200 words in length, which were presented as interviews with experts in various areas. Respondents were asked to read and "highlight" each interview, and then to rate them on a series of scales concerning their interest value,

readability, understandability, and the knowledgability of the interviewee. The messages addressed four "A" propositions. None of the messages contained any information concerning the related "B" propositions.[1]

Procedure

Respondents were tested as indicated in Figure 1. In the message groups, the respondent were informed that they were pretesting the messages for use in the following semester, and the rating of the propositions was necessary since their opinions of these topics might influence their ratings of the messages. The no-message groups were told that the study concerned what types of beliefs were stable or unstable over time and so it was necessary that they respond the way they really felt at each administration of the questionnaire. All respondents were asked to be conscientious and "take their time" while filling out the questionnaire. At the final session, all respondents were debriefed concerning the entire design of the experiment, and given instructions concerning how they could contact the experimenter in order to obtain a brief summary of the results of the experiment at a later time.

Results

Fit of the Model

A predicted Pb score was computed for each respondent concerning each of the fifteen proposition sets based on equation [1]. In order to test the fit of the model, the responses of groups 2 and 4 were pooled, after initial analyses

revealed that they did not differ significantly on any of the subjective probability ratings or their inconsistency scores. (Inconsistency scores were computed by taking the absolute value of the difference between the predicted and observed Pb scores.) At the group level, the mean predicted and observed Pb scores (N = 15) were correlated .91, with a mean inconsistency score of .05 (on a scale from 0 to 1.00; one unit of the metric). On the individual level, the mean within-subject predicted-observed correlation was .69 and the mean inconsistency score was .15.

Message Effectiveness

As a manipulation check on the persuasive messages, a 2 X 2 unweighted means analysis of variance was performed on the subjective probability ratings of the four target "A" propositions. The factors in the ANOV were a message-no message and a pretest-no pretest factor. Four separate ANOVs were performed. There was a main effect for the message manipulation in all four analyses (Fs = 78.51, 51.07, 103.34, and 44.57, all ps < .01). The mean change in Pa was an increase of .375. None of the other effects were significant in the analyses except for an interaction effect with respect to the first target proposition (F = 5.45, p < .05) such that the pretested respondents who received a message exhibited more change than did the non-pretested message group.

H1: Effects of a Change in the Premise on the Conclusion

Given that the persuasive messages had their desired impact, the first hypothesis addressed the question of whether equation

[2] accurately modeled the ensuing ramifications on cognitive structure. This was investigated in two ways. The first was the correlation of the predicted and observed ΔPb values for the four target syllogisms. In light of the small sample size, however, these correlations must be interpreted with caution. In addition to the correlational analysis, mean absolute discrepancy scores were calculated by taking the absolute value of the difference between predicted and observed ΔPb scores.

The results of these analyses are shown in Table 1. Only the largest of the four correlations shown is significant. Two of the discrepancy scores which were obtained were in the same range as the inconsistency scores reported for the fit of the model (.16 and .19). The remaining two scores, however, were notably higher. Inspection of the data involved indicated that, in both cases, two markedly deviant cases had considerable effect on these scores. It would seem, overall, that equation [2] was reasonably accurate in two cases, and somewhat inaccurate in two others.

Insert Table 1 about here

It was also one of the purposes of the present study to investigate which components of the model are affected by a change in Pa. In order to facilitate the discussion of the results obtained, Table 2 shows the inconsistency scores, Pb ratings and salience for each of the four message-target syllogisms. Having obtained an increase in Pa, any one of

several things might happen: the inconsistency score might rise, indicating that the change in Pa had no effect on the other components of the model; the salience score might decrease, thereby "preventing" the change in Pa from "reaching" Pb; or Pb might also increase. Each of these possibilities will now be examined in turn.

Insert Table 2 about here

Examination of the inconsistency scores for the four message propositions indicates that three of them do indeed change significantly from time 1 to time 2, but that they change in the direction of greater consistency, not less. So it is clear that changes in Pa do not upset the balance of equation [1].

Examination of the salience scores shows that three of them decreased and one of them increased, although none of the changes attained the standard levels of significance. Changes in salience therefore did not play a significant role in the maintenance of balance for these syllogisms.

In order to examine the effects on the Pb scores, 2 X 2 unweighted means ANOVs were performed on the Pb ratings at time 2 in order to determine whether the observed changes in Pb were due to message effects or pretesting. These tests were performed for each of the four Pb values in the message-target syllogisms. The two factors were the presence or absence of the pretest and the presence or absence of the persuasive message.

In no case were any pretesting main effects or message-by-pretesting interactions observed. Three of the four message main effects were significant. In the fourth case, however, that of syllogism 3, the observed increase in Pb did not attain statistical significance. Given the low salience for syllogism 3, however, this is not unexpected. Table 2 shows that the change in Pa was .47. Since the salience for syllogism 3 is .18, the predicted change in Pb is .08 (.47 X .18 = .08). The observed change is .07. In short, in this case, as in the other three, balance would seem to have been maintained by a change in Pb.

H2: The Effects of a Change in the "Conclusion" on the "Premise"

In order to investigate the repercussions of a change in a "B" belief on the rest of the syllogism, two syllogisms (which will be referred to as 5 and 6) were constructed such that their "B" Propositions, or "conclusions" were message-target propositions (A1 and A4, respectively). For example:

> A: The city of St. Louis recently adopted easier requirements for becoming a member of its police department.
>
> B/A: Suppose that the city of St. Louis recently adopted easier requirements for becoming a member of its police department. All things considered, how likely is it that there will soon be an increase in the number of police officers in St. Louis?
>
> B: There will soon be a substantial increase in the number of police officers in St. Louis.

The issue addressed was whether the change observed in the Pb term would affect the associated salience and/or the Pa term.

An initial point of inquiry was the change equation. The correlation between predicted and observed ΔPbs for syllogisms 5 and 6 were .04 and .25 respectively. The absolute discrepancy scores were .31 and .32, indicating that equation [2] was not highly predictive for either of these two syllogisms. A closer analysis of the components of these syllogisms seems warranted

Table 3 shows the ratings of Pa, Pb, and the salience and inconsistency scores for propositions 5 and 6 for the pretested and unpretested message groups (groups 3 and 4). Again, there was no change in the salience (both t's less then 1.70; both p's greater than .10). Repercussion effect must therefore be sought in the effects of the change in Pb on Pa.

The change in Pa was investigated using a 2 X 2 unweighted means ANOV of the type described above. The dependent variables were the Pa5 and Pa6 ratings for the fours groups at time 2. The means and standard deviations for these analyses are shown in Table 4; their associated Ns are shown in Figure 1.

Insert Tables 3 and 4 about here

For syllogism 5, there were no significant main effects or interactions; the change in Pb had no effect on Pa. For syllogism 6, the sole significant effect was the pretesting effect ($F(1, 88) = 10.105$; $p < .005$); again, the change in Pb had no significant effect on Pa.

The other curious effect reflected in Table 3 is the increase in inconsistency as a function of the reception of the message for syllogism 5. This is in contrast to the finding that all other syllogisms showed a decrease in inconsistency. A 2 X 2 unweighted means ANOV confirmed the significance of this increase, and the fact that it was due to the message manipulation rather than pretesting ($F(1, 88) = 3.14$; MSe = 1.877; $p < .003$).

Discussion

The present data offer a number of insights into research using Wyer's model. Experiment 1 demonstrated an important problem with respect to the operationalization of conditional probabilities. It was found that phrasing conditional probabilities in an "If-then" format, as is typical of Wyer's work and other research using subjective probability models, may encourage respondents to interpret such probabilities in terms of causality. Such a "causality bias" is inconsistent with the mathematical conceptualization of conditional probabilities. Future research and applications of the model would be best advised to avoid an "If-then" format.

Experiment 2 demonstrated that, in response to a change in the subjective probability of a "premise", the cognitive structure responded quickly, efficiently, and logically to restore the cognitive balance described by equation 1. Change in "premises" lead to changes in "conclusions"; the psychological salience of the premise with respect to the conclusion was not affected. Such a change in salience would

correspond to a sort of defensive reaction; like winning what appeared to be a major point in an argument and having the other individual say, "Well, that doesn't really matter anyway." For the topics considered in the present study there was no evidence for the use of such mechanisms for the restoration of balance. In respect for ethical considerations, however, the present study deliberately used topics which were not particularly ego-involving; in the case of other types of topics, other types of balance-restoration mechanisms might be observed.

Unlike the logical changes observed after altering the subjective probability of a premise, changes in the conclusion of a syllogism seemed to have little effect on the other elements of the syllogism. One syllogism showed an increase in its inconsistency score as a result of a change in the conclusion, a result predicted by the "cognitive inertia" effect discussed by McGuire (1960a, c). The other syllogism whose conclusion was changed did not show that effect. But that second syllogism demonstrated a curious pretesting effect which curious assymetry in the logical repercussions of belief change. was not observed in any of the other syllogisms, which may have served to "mask" the existence of cognitive inertia (by increasing belief in the premise and thereby decreasing the inconsistency caused by the change in the conclusion). The lack of any similar increase in inconsistency when the premise was changed, however, questions the parsimony of the evocation of the effect in the case of a change in the conclusion. More research is clearly indicated to determine the generalizability of these results, and to explore the possible ramification of

these results, if they continue to be evidenced. In addition, research using Wyer's model should be developed in applied settings. Applications of Wyer's model have been almost non-existent although the model could be of considerable interest to applied psychologists. An example of such an application is presented an discussed in Jaccard, Knox, and Brinberg (1979).

References

Campbell, D. T., & Stanley, J. C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally, 1963.

Donahue, M. J. An investigation of the effects of belief change on cognitive structure. Unpublished master's thesis, Purdue University, 1979.

Fishbein, M., & Ajzen. I. Beliefs, attitudes, intentions, and behaviors: An introduction to theory and research. Reading, Massachusetts: Addison-Wesley Publishing Company, 1975.

Jaccard, J., & King, G. W. A probabilistic model of the relationship between beliefs and behavioral intentions. Human Communications Research, 1977, 3, 332-342.

Jaccard, J., Knox, R. & Brinberg, D. Prediction of behavior from beliefs: An extension and test of a subjective probability model. Journal of Personality and Social Psychology, 1970, 16, 583-591.

McGuire, W. J. Cognitive consistency and attitude change. Journal of Abnormal and Social Psychology, 1960, 60, 345-353. (a)

McGuire, W. J. Direct and indirect effects of dissonance-producing messages. Journal of Abnormal and Social Psychology, 1960, 60, 354-358. (b)

McGuire, W. J. A syllogistic analysis of cognitive relationships. In M. J. Rosenberg, C. J. Hovland, W. J. McGuire, R. P. Abelson, & J. W. Brehm (Eds) Attitude organization and change: An analysis of consistency among attitude components. New Haven, Conneticut: Yale University Press, 1960. (c)

Wyer, R. S., Jr. Quantitative prediction of belief and opinion change: A further test of a subjective probability model. Journal of Personality and Social Psychology, 1970, 16, 599-570.

Wyer, R. S., Jr. Test of a subjective probability model of social evaluation processes. Journal of Personality and Social Psychology, 1972, 3, 279-286.

Wyer, R. S., Jr. Category ratings as "subjective expected values:" Implications for attitude formation and change. Psychological Review, 1973, 80, 446-447. (a)

Wyer, R. S., Jr. Further test of a subjective probability model of social influences. Journal of Research in Personality, 1973, 7, 237-253. (b)

Wyer, R. S., Jr. Direct and indirect effects of essay writing and information about other persons' opinions upon belief in logically related propositions. Journal of Personality and Social Psychology, 1975, 31, 55-63. (a)

Wyer, R. S., Jr. Functional measurement methodology applied to a subjective probability model of cognitive functioning. Journal of Personality and Social Psychology, 1975, 31, 94-100. (b)

Wyer, R. S., Jr. An investigation of the relations among probability estimates. Organizational Behavior and Human Performance, 1976, 15, 1-18.

Wyer, R. S., Jr., & Goldberg, L. A. Probabilistic analysis of the relations among beliefs and attitudes. Psychological Review, 1970, 77, 100-120.

Footnotes

1. Copies of the messages and syllogistic sets are presented in Donahue (1979) and may be obtained from the authors upon request. Michael Donahue or James Jaccard, Department of Psychological Sciences, Purdue University, West Lafayette, Indiana, 47906.

Group	Time I	Time II	N
1		O	26
2	O	O	21
3		XO	24
4	O	XO	21

Figure 1. Experimental Design: Solomon Four Groups

Table 1. Correlations, and means and standard deviations of absolute discrepany scores, between predicted and observed Δ Pb scores.

	r	$\lvert \Delta Pb - \Delta \hat{P}b \rvert$	SD
B1	-.10	.264	.257
B2	.64	.160	.091
B3	.21	.310	.274
B4	.18	.190	.183

Table 2. Inconsistency scores, Pb ratings and salience scores for the four message-target syllogisms, Times 1 and 2, Group 4

Syllogism		T1	T2	*t*	*p*
1	Inc.	.20	.18	0.43	.67
(St. Louis	Pb	.40	.63	-3.52	.002
Police)	Sal	.37	.35	0.24	.82
2	Inc.	.15	.09	2.72	.01
(Shortage of	Pb	.59	.80	-4.41	.001
Eggs)	Sal	.47	.39	1.83	.082
3	Inc.	.26	.09	2.74	.01
(Earth-Sun	Pb	.37	.45	-1.17	.26
Moon)	Sal	.18	.15	0.39	.703
4	Inc.	.19	.08	2.61	.02
(Mexican	Pb	.60	.82	-5.47	.001
Population)	Sal	.38	.42	-0.75	.46

Table 3. Pa, Pb, salience and inconsistency scores for the pretested and non-pretested message groups for syllogisms 5 and 6

Syllogism		Time 1	Time 2
		Pretest	
5	Pa5	.54	.42
	Pb (Pa4)	.53	.86
	Sal	.31	.25
	Inc.	.13	.26
6	Pa6	.57	.70
	Pb (Pa4)	.53	.88
	Sal	.30	.24
	Inc.	.18	.15
		Non-pretest	
5	Pa5		.48
	Pb (Pa1)		.73
	Sal		.33
	Inc.		.15
6	Pa6		.54
	Pb (Pa4)		.70
	Sal		.30
	Inc.		.17

Table 4. Means and standrad deviations of the Pa5 and Pa6 ratings for each of the four groups at time 2.

Pa5

		Pretest: Yes	Pretest: No
Message: Yes		$\bar{X}$ = .417 SD = .155	$\bar{X}$ = .479 SD = .285
Message: No		$\bar{X}$ = .524 SD = .155	$\bar{X}$ = .492 SD = .176

Pa6

		Pretest: Yes	Pretest: No
Message: Yes		$\bar{X}$ = .700 SD = .142	$\bar{X}$ = .535 SD = .190
Message: No		$\bar{X}$ = .602 SD = .193	$\bar{X}$ = .548 SD = .127